Appendix B: STTR and the Technology Taxonomy

NASA's technology development activities expand the frontiers of knowledge and capabilities in aeronautics, science, and space, creating opportunities, markets, and products for U.S. industry and academia. Technologies that support NASA's missions may also support science and exploration missions conducted by the commercial space industry and other Government agencies. In addition, NASA technology development results in applications for the general population, including devices that improve health, medicine, transportation, public safety, and consumer goods.

The 2020 NASA Technology Taxonomy is an evolution of the technology roadmaps developed in 2015. The 2020 NASA Technology Taxonomy provides a structure for articulating the technology development disciplines needed to enable future space missions and support commercial air travel. The 2020 revision is composed of 17 distinct technical-discipline-based taxonomies (TX) that provide a breakdown structure for each technology area. Taxonomy uses a three-level hierarchy for grouping and organizing technology types. Level 1 represents the technology area that is the title of that area. Level 2 is a list of the subareas in the taxonomy is a foundational element of NASA's technology management process. NASA's mission directorates reference the taxonomy to solicit proposals and to inform decisions on NASA's technology policy, prioritization, and strategic investments.

The 2020 NASA Technology Taxonomy can be found at:
(https://www.nasa.gov/sites/default/files/atoms/files/2020_nasa_technology_taxonomy_lowres.pdf).

The research and technology subtopics for the STTR program are identified annually by Agency's Center Chief Technologists (CCTs). The CCTs identify high-priority research and technology needs for respective programs and projects.

The table on the following pages relates the current STTR subtopics to the Technology Taxonomy.

2020 TX Mapping Level 1	2020 TX Mapping Level 2	STTR Subtopic Number	Subtopic Title
TX06 - Human Health, Life Support, and Habitation Systems	TX06.2 - Extravehicular Activity Systems	T6.08	Textiles for Extreme Surface Environments and High Oxygen Atmospheres
TX07 - Exploration Destination Systems	TX07.1 - In-Situ Resource Utilization	T7.05	Climate Enhancing Resource Utilization
	TX07.2 - Mission Infrastructure, Sustainability, and Supportability	T7.04	Lunar Surface Site Preparation
TX08 - Sensors and Instruments	TX08.1 - Remote Sensing Instruments/Sensors	T8.07	Photonic Integrated Circuits
	TX08.X - Other Sensors and Instruments	T8.06	Quantum Sensing/Measurement and Communication
TX09 - Entry, Descent, and Landing	TX09.1 - Aeroassist and Atmospheric Entry	T9.02	Rapid Development of Advanced High-Speed Aerosciences Simulation Capability
TX10 - Autonomous Systems	TX10.1 - Situational and Self Awareness	T10.05	Integrated Data Uncertainty Management and Representation for Trustworthy and Trusted Autonomy in Space
TX11 - Software, Modeling, Simulation, and Information Processing	TX11.X - Other Software, Modeling, Simulation, and Information Processing	T11.05	Model-Based Enterprise
		T11.06	Extended Reality (Augmented Reality, Virtual Reality, Mixed Reality, and Hybrid Reality)
TX12 - Materials, Structures, Mechanical Systems, and Manufacturing	TX12.2 - Structures	T12.09	Carbon Fiber Reinforced Thermoplastic Composites for Repurposable Aerospace Applications
	TX12.4 - Manufacturing	T12.08	Manufacturing and Construction of Lunar Landing Pads Research
		T12.01	Additively Manufactured Electronics for Severe Volume Constrained Applications
TX13 - Ground, Test, and Surface Systems	TX13.1 - Infrastructure Optimization	T13.01	Intelligent Sensor Systems
TX 14 Thermal Management Systems	TX 14.1 Cryogenic Systems	T14.01	Advanced Concepts for Lunar and Martian Propellant Production, Storage, and Usage
TX15 - Flight Vehicle Systems	TX15.1 - Aerosciences	T15.04	Full-Scale (Passenger/Cargo) Electric Vertical Takeoff and Landing (eVTOL) Scaling, Propulsion, Aerodynamics, and Acoustics Investigations